

*Conclusions & Recommendations
from*

PROJECT ASPEN

(Automated Systems for the
Production of Intelligence)

30 / 1970

Central Intelligence Agency

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II. COMPUTER APPLICATIONS IN SUPPORT OF INTELLIGENCE PRODUCTION

Conclusions and Recommendations

We recommend that:

57. The Agency establish as standard procedure in the development of new collection systems the coordination of the data collection and data forwarding formats with the individuals who must perform the data reduction and analysis of the data should the collection system become operational.

58. The Information Processing Board assure the acquisition, development, and use of one or more general data management systems which are sufficiently close to the general design requirements for Agency data processing applications to permit their adaptation and use for a wide range of data processing applications and data processing centers. We believe that general systems to incorporate such applications may best be acquired from commercial vendors in the interest of economy of maintenance, and simplicity and generality of system operation. Experience with indigenous development of such systems seems to indicate that we tend to build overly elaborate systems which provide better for certain internal requirements but tend to violate the other canons outlined above.

59. The Information Processing Board assure that the present capability for development of a unique program to process an application is maintained, so that any application whose objective is clearly unattainable by incorporation into a general data management system may continue to be developed. We would make it clear that increased use of general data management systems should not displace other applications programming activity except where its speed, economy, and prospects for ease of data exchange make it more attractive. It seems ideal, however, for small, infrequently used programs which are subject to change over time.

60. The Information Processing Board and its Technical Panel be charged with creating the means for the development of meaningful communications between the systems analyst-programmer and the substantive analyst who may be engaged in the common development of a computer application. Have them assure that the requisite direction and training is given to accelerate the reduction of communication barriers which still exist.

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61. The Agency provide time and professional and clerical assistance to a few talented individuals each year to explore, develop, and test essentially new techniques or new concepts in the use of ADP to support intelligence analysis and production. These applications may be developed under the leadership of either the substantive component, or OCS depending upon the nature of the application and the resources required to do the job.

62. The Information Processing Board assure that the present effort to provide a general time-sharing capability in OCS to serve the interest of the Agency as a whole be strengthened to provide not only on-line but also remote batch processing and remote job entry via terminals distributed so as to make them convenient to users throughout the intelligence production components.

63. The Information Processing Board, in consultation with the interested parties, assure that the OCS Interactive Services System provides a general data management system capable of providing an on-line, quick response capability for large information storage and retrieval activities of the type characterized by the [REDACTED] AEGIS, [REDACTED] data bases. We believe that the present and foreseeable rates of use for these files in an on-line environment are not high enough to warrant economic use of individual processors to support them.

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64. The Agency seek to secure an evaluation of the present COINS experiment at the earliest possible moment in an effort to provide clearer guidance for future Agency planning for participation in Intelligence Community ADP activities.

65. The Information Processing Board define minimum standards for control over data entry, data base documentation and file maintenance for any ADP application serving more than one component (defined as a unit under the first-line supervisor).

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IV. A CENTRAL REFERENCE SYSTEM

Conclusions and Recommendations

35. We recommend that: the Central Reference Service be established as the point of contact for any general request for intelligence information from outside the Agency or from within where there is no immediate known point where the needed information is available.

36. Only those data which are generated and accessioned by the reference center be provided as a direct response by the center and that all other data are sought first from another center in the Agency which may have resources to respond.

37. Work under way on an automated dissemination system should be maintained and each distribution point to be employed in the initial system test should be directed to cooperate with CRS in providing carefully constructed "dictionary" terms to try to guide this system. The work should be recognized as experimental at this stage, but it should be widely encouraged for its long-term prospects.

38. Planning for undertaking an extension of the automated dissemination system from SI input to all State, Defense and Agency positive intelligence information received in machine language should be undertaken coincident with the beginning of feasibility testing.

39. The present concept of CRS indexing should be continued, and a systematic effort undertaken to facilitate indexing input from the substantive analyst and to encourage such input to the system.

40. The Central Reference Service should seek as a general objective a standardized document reference number which can be put on the intelligence information document before it is disseminated. This reference should be capable of being generated and included in the format of any automated document dissemination system, and should become a part of that system as quickly as possible. It should be made an Agency standard immediately and expanded into a Community Standard eventually.

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41. The concept and scope of document indexing by a reference center should be developed by a top management decision. Established at a lower level, it results either in extensive duplication of effort or in abandonment of control over the use of intelligence documentation. Document index processing has, however, been customized by each processing organization which supports an individual or organization reference activity.

42. The Central Reference Service should create a personnel-area-subject index to other organized collections of information in the Agency. This index should include both personal and organizational collections of information and authorization points for control of access to the respective collections. This index is an important and complex system which must be carefully defined, coordinated and implemented. CRS should be assigned responsibility for design and development of the system but they must have the full cooperation of all the other offices and directorates. Development of such a system would pose an excellent test of the Information Processing Board.

43. The present method of document storage and retrieval is acceptable and should be maintained. It provides speed when it is genuinely needed and is far more economical than any system of electronic storage or video storage that we have encountered. We believe that the Agency should continue to experiment with a limited number of applications in which documents are created, stored, and searched retrospectively in an electronic format, because development of an on-line document index will almost certainly require a simultaneous improvement in the speed of delivery of documents.

44. An extensive interactive (man - machine - data base) capability with the Central Reference Services intelligence document index should be developed and tested as quickly as feasible. This is one of the few large data bases in which we think there is both wide interest and frequent use. Indeed we are told by analysts that the principal limitation on their use of the system is its slow response time.

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V. RESEARCH AND DEVELOPMENT (R&D) IN INFORMATION PROCESSING

Conclusions and Recommendations

13. Both ORD and OCS have long experience in general contact and service throughout the Agency. Beyond that point most of the activities which seem critical to us for information processing research and development have always been performed in OCS. A genuine effort was made early in the development of ORD/An to coordinate its activity with OCS, but this effort disintegrated from a halting start to a general awareness of each other's existence although some effort to restore an interaction has begun this year. Individuals located in OCS have both the technical expertise and the awareness of processing activity throughout the Agency required to provide an optimum service to the user. What must be created in OCS is confidence that Agency management will support the separation of general development activity from the press of production activity. Having seen the Agency willing to support development work with money and positions elsewhere and having seen the diseconomies of the present system, we believe that OCS would be willing as well as able to undertake control over this activity.

14. We recommend that the DD/S&T review the division of effort between ORD and OCS in the area of information processing research and development against an alternative allocation of function and effort which would:

a. Provide for the subsequent problem definition, and computer application design and development effort to be moved from ORD to OCS.

b. Provide for the transfer of essentially standard computer processing equipment from ORD to OCS and for OCS to provide a level of experimental or developmental computer processing time necessary to support the expanded experimental function outlined above. We would for example urge the processing time might be made available on machines appropriate to the work involved rather than on a single machine which is used only for experimental work.

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c. Provide for the transfer of other equipment from the IPRD laboratory to those surviving or anticipated development programs which may use it most effectively, the rest to be transferred to surplus.

d. Provide for a review of existing ORD contracts through the Information Processing Board and selected prospective users to determine which of these contracts should be continued and under whose leadership they should proceed.

e. Provide that subsequent ADP equipment or software test and analysis be conducted by OCS except where the items are a direct adjunct of a special processing center such as NPIC. The special unit would procure and test the latter products.

f. Provide for OCS to issue a current awareness publication similar to its present Tech Notes to announce new activities, new products, and new developments which its research and development component consider of general interest for Agency components engaged in information processing.

15. In addition we recommend that the DD/S&T and the Information Processing Board reject the proposal of the R&D Subcommittee of the USIB Information Handling Committee which proposes a community wide R&D Center on the basis of the recent experience with COINS and the IPRD which we believe demonstrate both the difficulty of an integrated community activity and the impracticality of performing research and development on non-existent or badly defined requirements.

16. Finally we recommend that research and development projects or programs in the area of information processing be submitted to the same scrutiny as that proposed for ADP projects in the section below dealing with management.

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VI. ORGANIZATIONAL AND MANAGEMENT ELEMENTS OF AUTOMATIC DATA PROCESSING

Conclusions and Recommendations

26. We recommend that: The Agency reassert a policy of providing a high degree of centralization in data processing activity in the Office of Computer Services, that this policy be tempered by permitting the acquisition of small or medium computer processors by functional organizations where there is a demonstrable technical-computational economy in using a stand-alone computer system, and that this policy continue the present emphasis on the functional component (user) responsibility for problem definition and problem solution. In short we recommend that computer organizations develop the systems necessary to run the computers and run them, and that functional production people prepare the data and the processing steps required for its transformation by computer.

27. A central technical management review of major ADP projects be created under the present umbrella of Executive Director-Comptroller responsibility for Agency ADP management, that a full-time position of ADP Advisor to the Executive Director-Comptroller be created for an experienced ADP professional whose responsibility it would be to:

- 1) advise the Executive Director-Comptroller on all professional/technical matters relating to ADP;

- 2) be chairman of the IPB and the director of its permanent staff;

- 3) review the various local plans, provide technical input to IPB and, periodically, develop a statement of long term ADP objectives for the Agency;

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4) assign computer application design proposals to the suitable functional/technical review components;

5) prepare Agency-wide ADP technical standards;

6) serve as chairman of the Agency-wide ADP Career Service Board;

7) serve as focal point for internal leadership and for external relations in ADP technical/professional matters.

28. Existing central ADP planning be strengthened to provide:

1) for a more definitive outline of Agency objectives to be achieved in related or overlapping office plans and for regular revision and publication of the Agency ADP Plan,

2) for the definition and publication of Agency-wide ADP technical standards beyond the present work on nationwide (USASI) standards, and

3) for a standard format and procedure for the proposal and review of major requests for the acquisition of computer systems or of computer processing applications.

29. A means of pricing data processing services performed by computer centers be developed, and that each user component be required to budget for its data processing services and transfer the funds to pay for these services in essentially the same way that property funds are handled.

30. An Agency ADP Career Service be created.

31. Existing ADP training programs introduce additional emphasis on the changing responsibility or role of the user in an on-line and/or real-time computer environment, and that functional organizations review the need for unit training of personnel in the use of quantitative and/or logical techniques in indigenous analytical problems.

32. The Director, OCS be an ex officio participant on the Information Processing Board and that the DD/S&T should be represented on the Board by an individual who reflects the computer user population of the whole Directorate. The presence of the Director, OCS on the Board is imperative, but we believe he should participate in his capacity as director of computer processing rather than as the representative of a Directorate with large processing requirements.

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1. FOREIGN MISSILE AND SPACE ANALYSIS CENTER

1.4 Conclusions and Recommendations.

The comprehensive ADP needs of FMSAC for its intelligence production requires daily consultation and support from the Office of Computer Services (OCS). The established excellent working relationship between OCS and FMSAC personnel has been instrumental in developing and maintaining ADP applications to support FMSAC's intelligence production. The following recommendations are suggested to continue and expand the OCS-FMSAC ADP efforts:

(1) Expand coordination between OCS and FMSAC when changes in OCS digital computer equipment, systems, and/or operating procedures are to be implemented.

(2) Extend OCS efforts to obtain and/or evaluate a general purpose data management system for Agency use and to support FMSAC's Information System requirements.

(3) Continue experimentation with use of ADP for intelligence production, (e.g., generate the FMSAC quarterly reports of analyses on foreign missile and space events from the new comprehensive Information System).

(4) Provide expansion capabilities to improve data processing of current information receipts, to economically process peak loadings of information, and to provide for processing a steady growth of foreign missile and space information. Information refers to both measured or intercepted data and textual messages.

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2. OFFICE OF ELINT

2.4 Recommendations.

We believe that the development of advanced ELINT processing systems, capable of fully exploiting the signal environment in which the Agency has undertaken a collection and production responsibility is essential. Better coordination of OEL-contractor interaction with OCS systems analysis efforts to support both the OEL processing and the OEL collection activities seems to be needed. Indeed, we observe that there is a large and diverse effort in signal analysis spread over a wide range of organizations including OEL, FMSAC, OCS,

An/ORD, OC and FI. The techniques of using automata to support such analysis have many attributes in common and can, in many instances, be solved using common techniques. We believe that a form of technical review much like what is proposed in the main section of the paper on organization and management is needed to provide a better coordination and control of these various analysis programs and with it a better use of our limited technical capabilities to support automation of signal processing.

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The recommendations contained herein are primarily concerned with the Analysis Division, as this division is most closely allied with the production of intelligence in the ASPIN sense. However, since the analysis function is often tied in with the collection effort, recommendations regarding one will have direct or indirect bearing on the other. For example, certain analysis systems were designed to work with a particular collection system over which the Analysis Division had little or no control.

We recommend that a technical review panel be established to review past, existing and proposed Analysis programs and projects to determine their relative effectiveness, relationship to each other and to other work being done on signal analysis. Those programs, whether in existence or being developed, which cannot demonstrate a unique, cost-effective capability should be abandoned.

The review mechanism to carry out these recommendations should include representatives from the various organizations involved in signal processing, and possibly an outside contractor at the outset. A properly constituted body could, and we think should, carry a comparable review of work being done in the signal processing area by each of the organizations identified in 2.3.2 above.

We recommend that a continuing effort be made to provide personnel to Analysis Division to permit them to undertake internally the conceptual and detailed design of the processing interface to OEL collection systems presently performed under contract.

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3. OFFICE OF SCIENTIFIC INTELLIGENCE

3.6 Conclusions

OSI's "walk-before-you-leap" approach to ADP seems sensible to us. It is easy to inaugurate projects with outside "help" but more difficult to assure the direction of these projects to show improvement in operations, particularly a cost saving. In the "number-crunching" field -- solving calculations that would be impossible because of their complexity or number of interactions, as for the ABM problem -- OSI has been successful and these efforts seem well in hand and evolving satisfactorily. The recent addition of remote terminals in an on-line system will particularly facilitate program development and test as well as interactive running of computational programs. In general OSI's computer usage is growing steadily as more uses are found, more personnel become familiar with it, and more equipment becomes available.

The area that seems to hold promise for the greatest improvement is in data indexing, storage, and retrieval, (ISR), but there appears to be no single high-priority OSI intelligence problem that would justify an ISR research effort by itself. OSI should support any Agency effort in this area, such as that by CRS to extend FMSAC's automated dissemination system.

What are the characteristics of ADP that make it unique with respect to manual systems? For years we were led to expect savings because of the savings ADP produced in the performance of clerical functions. In the development of assistance to intellectual

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or analytical activity, neither money nor manpower is likely to be saved. Speed is great but there's what has been called a "5 millisecond and 48 hours" effect - the machine operates in fractions of a second, but delivery of input and output may take days. To some extent development of real-time sensors hitched to reliable communication systems has begun to reduce this problem. Remote terminals have helped the analyst in his design or computational problem, but OSI, by the nature of its tasks, has few problems requiring instantaneous responses.

The factor of most importance to OSI would seem to be what I term comprehensiveness. As files grow the analyst tends to remember best the most recently acquired reports, whereas an older report could be of more significance for his immediate problem. One expert in the field has said that nowadays most decisions are made following consideration of no more than 20% of the facts that bear on the question; an automated data retrieval system should be able to raise that percentage. This might well require reeducating analysts in how to use large volumes of material. Most today "intuitively" feel their decisions are correct, based on their experience and on a small percentage of the available facts. With more facts, if they know how to separate wheat from chaff, more solidly based decisions should be forthcoming.

There is also the case of the 20- or 30-year analyst who retires and his personal files, whether well organized or not, are kept for awhile and eventually discarded. This is a tremendous waste of our resources. The information in such files, if they could be in an automated file, would then remain available for use by anyone.

The other principal factor is ability to handle large volumes. Most analysts have reasonably efficient files, i.e., they are reasonable in size and cost, furnish speedy access to desired information and are reasonably easy to maintain. The average OSI analyst receives 82 documents per day and spends 9% of his time maintaining his file; less time and he would not know what was in his file. But the charts of CRS indicate an ever growing influx of data for the 1970's and most analysts are going to need the help of ADP in managing their data bases efficiently. Even now some files are large and threatening to become unmanageable. Manual files should be set up so that they can easily be converted to ADP if desired. For instance typefaces should be standardized with respect to optical character readers (OCR). Research in the OCR field should be pushed as part of the input problem. Such developments as that at Compuscan should be

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carefully monitored -- as CRS is doing -- for possible use by the Agency.

Even today there are a few analysts with a large number of incoming documents (1000 NSA electricals or 1500 Navy cables a month). Since these are already in machine readable form at some stage of their transmission, development of an automatic sort/dissemination system should be pushed strongly. Another similar problem is that of such high-volume, low-value sources as press and [REDACTED] ticker. An automatic sort/dissemination system for this material would save many hours of analysts' time.

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Another part of the input problem is with large existing analyst files. No way has yet been devised for economically changing such manual files into automated files. The only method available is a "brute force" typing or key punching job that can be justified only for highest priority problems. Can new types of Optical Character Readers help here? Or possibly Computer Operated Microfilm offers promise. [REDACTED] is investigating part of this problem for CRS.

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The ASPIN questionnaire showed that OSI analysts seldom use central files and then mainly as a back-up for personal files. A management problem is thus to determine whether the present type central reference service can be justified if it is used predominantly for archival or back-up use. On the face of it, it would seem that it might be more efficient to allow analysts/branches to maintain larger automated files within their specialty and for the reference library or service to publish (and keep up to date) a directory of where different types of information are stored. However the AEGIS file system is good and improving and in existence, while automated personal files are few and far between at present. CRS must educate the working analysts as to the thus-far underused capabilities of AEGIS. It would certainly be beneficial for users if remote terminals now installed for OCS computers could also be linked to CRS's AEGIS system.

3.7 Recommendations

Where do these conclusions lead us? There seem to be two prime areas of consideration for OSI: support of the R&D effort and education and training.

1. OSI should support strongly, with money and manpower if needed, promising research and development efforts in the following areas:

(a). Sort/dissemination/storage system along lines of [REDACTED] proposal in CRS.

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(b) Personal file management, along lines
of [REDACTED] work for CRS.

(c) Input/output research of ORD and other
Agency components looking into OCR, computer output
to microfilm (COM), or other methods.

2. OSI should push training of its own personnel
in ADP so that they may better adopt this technology
to the analytical and operational problems of the office.
This user education should cover both interactive systems
and batch processing. The users cannot sit back and
await developments, but must jump in and learn enough
about ADP to influence development. There exists a
continuing need for training of analysts in the develop-
ment and manipulation of files with or without ADP to
improve our research effort.

3.8 Original ASPIN Survey Questionnaire for OSI (attached).

3.9 Original ASPIN Questionnaire for Established ADP Applications
(attached).

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4. CENTRAL REFERENCE SERVICE

4.9 Conclusions and Recommendations

4.9.1 Conclusions. Computers are making a significant contribution to the information handling aspects of CRS's mission and this contribution can be expected to improve in quality and increase in quantity in the future. Automatic dissemination is an example of a project which promises to improve significantly the quality of CRS's product through the use of computers. In general, file building and services are directly responsive to expressed user needs, and functional activities vary among CRS components to accommodate the needs of user offices. The [REDACTED] in CRS, ISG's heaviest single expenditure in terms of manpower, can be most effectively handled by a judicious manual/machine mix, as it is at present. New or expanded use of machines to support the [REDACTED] effort will no doubt be implemented as opportunities are identified. The installations and photographic functions also require both manual and machine methods. A centralized document storage and retrieval system is essential to the Agency and provides useful service to other agencies in the intelligence community. Subject retrieval using the computer has improved overall response to users. The AEGIS system is working well, although some modifications could result in better response to users.

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4.9.2 Recommendations Regarding AEGIS. Some adjustments, most importantly improved communications between end-user and the system and within the system itself, could significantly improve the system's performance.

Recommendation. Continue efforts toward creating on-line remote query capability within CRS. This capability would permit the ISG analyst to refine the query interactively while the request is still fresh in his mind and sufficiently early in the process to ensure timely delivery of citations to the end-user.

Recommendation. Encourage user participation by extending to him the opportunity to influence AEGIS data base coverage, indexing and query formulation. Specifically, (1) periodically circulate to production offices memoranda explaining

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changes in indexing and selection policies, (2) seek user advice when creating new "canned" queries for NIS runs, etc., (3) simplify procedures for and encourage ad-hoc selection of items for the data base by ISG analysts, (4) provide for expanded coverage of State Telegrams in the data base, (5) devise a method whereby production analysts can routinely recommend additional documents or index terms for documents already selected for the AEGIS data base.

Recommendation. Conduct a campaign to publicize CRS's service, especially as regarding AEGIS. Specifically, (1) expand and/or upgrade coverage of reference facilities in the CT program and in orientation training, (2) prepare easy-to-read tutorial pamphlets for user offices, (3) attach an information sheet to every AEGIS listing given to a user to include, at minimum, explanation of some of the special codes appearing in the listing and a clear definition of the contents of the data base queried (time span, document series, etc.), (4) change the name of the system to an acronym which better identifies its purpose.

Recommendation. Expand the training of ISG analysts in the use of AEGIS, with special emphasis on customer needs. Specifically, (1) conduct ISG-wide training classes for new analysts and refresher course for old, (2) continue and expand, if possible, the current practice of assigning ISG analysts to TDY tours in production offices to gain insight into customer needs, (3) limit assignment to a few analysts to handle AEGIS requests in branches where AEGIS runs are few.

Recommendation. Although substantial improvements in the document delivery sub-system have been achieved in the past, continuing attention should also be devoted to shortening the time required for the delivery of the documents themselves to the customer and further improving the quality of reproduction.

Recommendation. Accept as a goal the existence of a limited number of standardized software packages within the Agency and ensure that any future major changes in AEGIS software be compatible with this goal.

4.9.3 Non-AEGIS Recommendations

Recommendation. Investigate the possibilities of expanding the use of the computer to support CRS's other functions such as [REDACTED] installations and photographic. In particular, investigate the possibility of extending to the ISG analyst the ability to build and maintain special files on-line.

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Recommendation. Continue the automatic dissemination project as a viable and useful application of the computer in CRS's mission, and give specific attention to data preparation (message identification, Content Control Code, etc.) within and outside the Agency which might aid in the automatic dissemination of incoming documents.

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6. OFFICE OF BASIC AND GEOGRAPHIC INTELLIGENCE

6.4 Recommendations

1. Development of the AUTOMAP system should continue. The pace of development should be guided by the availability of resources and by the capacity of Agency cartographers to absorb new extensions of the system into their day-to-day operations. AUTOMAP developments should be carefully watched by people building other systems in which the manipulation of graphic data is an important system objective.

2. Experimentation with techniques of statistical and numerical analysis should be encouraged. Intelligence and other types of data collection activities which yield numerically manipulatable information related to OBGI's interests are well established, and the number of them is increasing. This fact argues for the need to develop an understanding of the methods needed to analyse and interpret numeric data.

3. OBGI should be careful to distinguish between ADP undertakings which center on the visible outputs of the Office's activity - particularly, encyclopedic and reference outputs - and those which are directed at the more recalcitrant problem of applying ADP to serve the analyst as an analyst in his intelligence producing role. ADP applications which assist in the publication of documents and

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support high-quality printing, and proposals which would put data collections now appearing in books under computer control are meritorious if the objectives are sound and are well met. However, these projects are not a substitute for the development of methods or systems which are operated on behalf of the analyst. The indications are that the Office recognizes this fact and that current activity in Geography Division is directed toward the investigation of ADP methods to assist and strengthen the analyst.

4. Geography Division and, to a lesser extent probably, Cartography Division, would stand to benefit from a program designed to bring to analysts an increased awareness of the AEGIS Subject Search System and to tell them how it works and how they can make use of it. The ASPIN survey has indicated that many analysts are not even aware that the Agency has a system for the retrospective searching of intelligence literature.

5. A joint attempt should be made by OBGI and the other production offices to open CRS' Subject Search System to documentary materials now excluded from that system. Analysts could request that certain documents be indexed by CRS, or index records could be created in the analytical components and then put into the system. Several offices are now exercising their privilege of tapping computer resources at will in order to develop their own special computer applications for controlling bibliographic data on documents of particular interest to them. Since these efforts are not being coordinated, the result is that a number of separate applications are springing up, all doing basically the same thing and all recreating to a great extent what has been already built into the existing system. Ironically, the only restraint on the proliferation of these separate systems is being applied by the computer services people who, within the limits of the requirements brought to them, are using existing software for these projects. This, however, is coordination by default rather than by plan and it does not, in any case, extend to coordination of design parameters and specifications.

6. At the time when specific ADP applications and computer activity in general are tending more and more to pervade the activity of intelligence analysis, the Agency should reconsider the implications of continuing to have one of its intelligence research elements physically separated from all the others and should consider the advisability of having Geography Division relocated in headquarters building. The physical isolation of the Geography Division analysts (in Magazine Building, in Rosslyn) from the Agency's other primary research elements and from the major Agency centers of programming and other computer activity is a barrier to the kind of relationships which tend to foster, over time, productive applications supporting intelligence analysis.

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8. OFFICE OF ECONOMIC RESEARCH

8.4 Conclusions and Recommendations

8.4.1 Scientific Computing. Most of OER's ADP applications originated to relieve analysts of the burdens of extensive manual calculation and to permit the use of sophisticated mathematical-economic models in analysis of intelligence problems. Key elements in continuing to improve OER's scientific calculation capabilities are: (1) the provision of scientific subroutine packages with greater power, (2) the training of OER analysts in the use of these packages and basic programming languages, (3) the provision of on-line access, and (4) the employment of semi-professional assistance in developing and maintaining ADP applications.

(1) Scientific subroutine packages: Analysts in OER have the computational capabilities of [REDACTED] available to aid them in their computational work. OER will continue to be alert to the development of new, more powerful packages which include scientific subroutines useful to economists.

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(2) Training: OER has a training program designed to teach the use of scientific subroutine packages and basic programming languages to professionals. This successful program has expanded the pool of manpower in OER which can use ADP facilities in resolving computational problems. OER should continue to control this training in a workshop mode so that office requirements for new techniques can be met as quickly as the new techniques become operational.

(3) On-line access: OER has two remote, on-line devices (an IBM 2260 terminal and an IBM 2741 terminal). As more terminals become available, OER analysts will have faster turnaround time on their computation problems than they have had under the past system of job submission to the OCS Center for batch processing. Terminals also drastically reduce the time spent writing and debugging programs submitted for batch operation. OER should develop the terminal-cluster concept of equipment location so as to optimize terminal usage, allow for a variety of terminals and provide assistance to new users. Including a Remote-Job-Entry device in the equipment cluster would reduce the time spent at terminals by analysts.

(4) Semi-professional assistance: OER should begin systematically selecting mature, intelligent and motivated clericals who appear to be career-oriented for formal and informal training in ADP skills (equipment operation,

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programming and file creation and management). A cadre of semi-professionals knowledgeable in inputting, maintaining and retrieving from file management systems in support of production analysts will become a valuable resource as the number of ADP applications in OER grows in the future. These intelligence assistants would not be expected to originate ADP applications or to liaison with computer centers.

25X1A 8.4.2 File Management Applications. The relatively few file management applications in OER's inventory of ADP applications suggests that there is substantial room for growth in this area. Indeed, several analysts specifically mentioned that the "record keeping" behind their ADP applications might be automated. Small file management applications can build from the lessons of the successful [REDACTED] projects: carefully selected subsets of existing systems were redesigned for the specific applications. Looking to the future, OER should move toward developing banks of raw, unevaluated intelligence data maintained at the branch level and repositories of finished, evaluated intelligence data maintained at the Office level. These sources would provide data for inter-country studies and for current intelligence support.

OER should exercise great restraint, however, in choosing data sets and ADP systems for major file management applications and should undertake such applications only if the likely benefits can be reasonably expected to greatly exceed the substantial costs in money and manpower required to implement file management applications. Unreliable hardware and complicated file management software have been barriers to implementation and acceptance of file management applications elsewhere. Moreover, any file management application will require substantial manhour commitments to maintenance even when operational. The amount of analyst time devoted to maintaining an operational ADP system should be carefully weighed against the alternative of manual maintenance of files in arriving at the decision on automation.

8.4.3 The Document Dissemination ("Mail") System. OER should participate fully in CRS's automatic dissemination project. This project is aimed, inter alia, at automating part of the existing system of document dissemination in the Agency. Production branches would be expected to contribute a list of keywords which describe their document receipt needs and in return the branches would receive faster, more accurate mail service, thus meeting a major complaint of many OER analysts. In the early stages, this participation will consist only of consultation with CRS, but in later, testing stages the project might benefit by the detailed cooperation of a specific OER branch.

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8.4.4 Centralized Document Storage and Retrieval. The Central Reference Service will periodically review and revise its system of centralized document storage and retrieval. OER analysts have found little use for this system in the past because of (1) the long time lag between the request to CRS and the receipt of hard-copy documents, (2) the large amount of unwanted and irrelevant material included in a returned run, and (3) the inconvenience in using the system. OER should provide consultative services to CRS in its attempts to improve the system and should encourage its analysts to work with CRS analysts in refining queries to the system. Substantial OER manpower resources should be committed to CRS' attempts to improve its system only if the features of that system which are important to OER analysts are to be materially improved over the existing system. For example, OER analysts should not be committed to index documents for any centralized document storage and retrieval system without a guaranty that the system's service in terms of timeliness, noise and convenience will be greatly improved over the service of the existing system.

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9. OFFICE OF STRATEGIC RESEARCH

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9.5 Recommendation

Conduct a controlled test to measure the effectiveness of [REDACTED] and to determine the detailed requirements for expansion and/or modification.

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10. NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER

10.4 Conclusions

10.4.1 Prime Source of Information. The primary source of information for NPIC's production efforts is of course imagery. While NPIC receives and utilizes other documents and materials in the production of its end product, such materials are used merely in a back-up or assist capacity in the exploitation of imagery, never as a prime information source.

10.4.2 Volume of Non-imagery Materials and its Control. The volume of the materials (other than imagery) received in NPIC is relatively small and the great bulk of such receipts is acquired through and controlled by the NPIC library operating on the basis of requirements received from other components of the NPIC. This system appears to work well and appears to be efficient.

10.4.3 Branch Files. There are some, but relatively few, Branch files maintained of these materials, practically no individual files. The great bulk of such materials retained by NPIC are physically kept in the files of the library and requests by NPIC analysts for information on documents subsequent to initial distribution are serviced from these library files.

10.4.4 Installations Data File. The most useful and productive ADP application at NPIC is said to be the Installations Data File formerly known as the Targets Brief File. This file is used in and is essential to the efficient operation of first and second phase exploitation, [REDACTED] Supplement produc- 25X1A tion).

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10.4.5 Exploitation Products File. The Exploitation Products File formerly called the All Source File is characterized as being important to the third phase exploitation (detailed PI report production).

10.4.6 Mensuration Parameters File. The Mensuration Parameters File which makes possible the highly accurate mensuration system at NPIC was cited as an essential capability that would probably not exist without ADP.

10.4.7 Evaluation of ADP Support. While there were some serious criticisms expressed of the ADP support provided to NPIC by the Automated Information Division it was felt by every respondent that their ADP applications were worth the work involved.

The deficiencies cited in and the improvements suggested for the NPIC ADP programs are the usual ones, i.e., response time frequently too slow and should be speeded up; file maintenance not kept current; retrieval capabilities not selective enough, etc.

The Integrated Information System which is in essence an up-dating of the major portion of the NPIC ADP capability should, when it becomes operational, alleviate and possibly eliminate the great bulk of the deficiencies noted in the NPIC ADP programs. In addition, it should also further reduce the amount of materials kept in Branch level files which in my opinion are considerably less in volume than one might expect in an operation the size of NPIC.

10.5 Recommendations

10.5.1 NPIC. As stated in the Conclusions, above, NPIC currently has its full share of problems in the ADP field. It is expected, however, that when the Integrated Information System (IIS) becomes operational (scheduled during second quarter of FY 1971) most, if not all, of these problems will be alleviated and/or solved. This is not to say that NPIC should then set back and be satisfied with its ADP posture. Rather, as soon as possible, after declaring the IIS operational, NPIC should devote a continuous effort to expand, improve, and update the system. The management of the Automated Information Division, NPIC, recognizes this and has identified a number of improvements which they plan to accomplish in the future. Among these are the following:

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(1) Provide both FORTRAN and COBOL programming capabilities at upwards of 100 terminal devices to NPIC professionals throughout the Center. Such capabilities will permit the computers to help solve specific problems encountered by these personnel in their particular areas of professional expertise.

(2) Continue efforts to develop a capability to search free text of documents.

(3) Expand the ADP support to the research, development, and engineering work of NPIC. In the past, little such support was possible because of the priority need to develop and implement the IIS.

(4) Continue to place emphasis on the need to improve the job priority structure, to optimize the utilization of random-access mass storage, and to seek a better method for using the two central processors and associated core.

10.5.2 COMIREX. The Exploitation Subcommittee and the Data Base Working Group for the COMIREX have been in existence now for approximately 2-1/2 years. During this time these two activities have accomplished a lot of good basic work.

The Exploitation Subcommittee has, for example, provided valuable leadership in the development of the National Imagery Exploitation Target Base (NIETB) and in identifying the essential elements of information that are potentially derivable on these targets from imagery. In addition, this committee has identified the requirements that should be satisfied during first and second phase exploitation.

The Data Base Working Group has provided valuable leadership in the development of the National Base of Imagery Derived Information (NBIDI) including identification of the files that make up the NBIDI, i.e., the Installations Data File, Objects Data File, Exploitation Products Data File, Area Coverage Data File, Mensuration Parameters File and the Imagery Interpretation Resource File. In addition, the Data Base Working Group developed a concept of computer service centers (one each in NPIC, NSA and DIA) to ensure that the information in the NBIDI is readily available to the users throughout the Intelligence Community.

We are concerned that the present lines of activity of these organizations show signs of developing a series of bureaucratic trenches rather than identifying and extending a

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national photographic interpretation reference system. Future plans of these committees should be carefully reviewed by COMIREX to see if the need to continue them still exists. Alternatively, it might be more appropriate to allocate such responsibilities as are still resident with them on the line organizations involved.

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